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# Different Aspects of the Emerging OER Discipline<sup>1</sup>

## Aspectos dos Recursos Educativos Abertos como área emergente

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## Abstract

The more recent interpretation of open education is related to open education resources (OER), open education practice (OEP), and open access publishing. Although related to the original, distance education based interpretation, there is a distinct community around these areas. The inception of the OER movement, which can be dated as 2001, can be viewed as the basis for the open education movement. Although still relatively recent, this provides a sufficient timeframe for different sub-communities to develop with a range of priorities and interests. Based upon a content analysis of the OER Knowledge Cloud repository, this article examines the emerging sub-cultures within open education practice. Ten types of research article are identified that represent different approaches and issues for the groups involved.

**Keywords:** Open education resources. MOOC. Open education practice.

## Resumo

A interpretação mais recente da Educação Aberta (EA) abrange Recursos Educacionais Abertos (REA), Práticas Educacionais Abertas (PEA) e Publicação em Acesso Aberto. Ainda que essa interpretação esteja relacionada à concepção original vinculada à Educação a Distância (EaD), há comunidades distintas ligadas a essas áreas. O advento do movimento REA, que data de 2001, pode ser visto como a base do movimento da EA. Apesar desse movimento ser relativamente recente, já decorreu tempo suficiente para a organização de diferentes subcomunidades em torno de uma gama de prioridades e interesses distintos. Partindo de uma análise de conteúdo da produção indexada no repositório *OER Knowledge Cloud (Nuvem de Conhecimento REA)*, este artigo examina as subculturas emergentes em termos de práticas da EA. Identificam-se 10 tipos de artigos de pesquisa que representam diferentes abordagens e questões para os grupos envolvidos.

**Palavras chave:** Recursos educacionais abertos. MOOC. Práticas educacionais abertas.

## I ntroduction

The open educational resource (OER) movement can trace its inception back to the MIT Open Courseware announcement in 2001. However, this inception has many diverse roots. OERs can be seen as direct descendants of learning objects, in that they are reusable, openly licensed educational content. The OER movement itself can be interpreted as the latest manifestation of the open education discipline, which can be traced back to the founding of the Open University in the UK, and to historical approaches to democratizing education (Peter and Diemann 2013). While there are important principles derived from these earlier branches of open education, OER has provided a focus for a movement to coalesce around. It provided a relatively clear definition (see Creative Commons 2016 for a list of definitions), funding through bodies such as the Hewlett Foundation, and definite outputs that could be used and quantified. This clarity around OER was allied with the emerging web 2.0 interest in sharing, reuse, and openness. OERs then seemed to capture some of the zeitgeist of the 00s, and the possibilities offered by the digital, networked technology.

Since the inception of the OER movement there has been further development around the possibility of Massive Open Online Courses (MOOCs). These have attracted substantial investment, and led to the development of numerous MOOC specific platforms including Coursera, Udacity, EdX, FutureLearn, iVersity. In many ways the success, and media attention garnered by MOOCs can be said to have eclipsed OERs. However, as the initial MOOC interest settles, the distinction between them and OER is becoming blurred. It can be seen as a granularity issue, with OER focused on individual pieces of learning content, and MOOCs at the whole course level. However, short MOOCs are now being developed, and OER are being packaged into courses, (for example with OER University), so this distinction becomes less valid. Similarly, one of the defining characteristics of OER is their licensing so that they conform to the 5Rs of Retain, Reuse, Revise, Remix and Redistribute (Wiley 2014). While not all MOOCs are not openly licensed, there are many which are (see for example <http://www.openuped.eu/>), and so this alone is not a distinguishing feature.

MOOCs then represent one aspect of a sub-culture or offshoot of the OER movement. Another such sub-domain is that of open textbooks. These are textbooks, usually in popular subjects that are written specifically to be openly licensed. The online version is available at zero cost and the print version can be purchased at low cost. These textbooks are produced by initiatives such as OpenStax and BCCampus, with the primary aim of reducing the burden of textbook costs on students. Because the textbooks conform to the 5Rs of open (<http://www.opencontent.org/definition/>) they are also adaptable and shareable, leading to changes in pedagogic approach. The very practical aspect of implementing new versions of textbooks has enabled direct comparisons of impact. For instance, DeMarte & Williams (2015) found that the implementation of open textbooks at Tidewater College led to improved teaching efficiency and effectiveness, and Weller *et al* (2015) found that use of OER caused educators to reflect on their pedagogic practice. The open textbook projects have largely been confined to North America however (with the notable exception of Siyavula in South Africa), where the high costs of textbooks is a particular issue which provides leverage.

OER has also been widely adopted as an approach in developing nations as a means of creating and sharing affordable content. For instance, OER Africa was established in 2008 to promote the use of OER in supporting the needs of higher education in Africa (Ngugi 2011). The TESSA project in sub-Saharan Africa used OER created by local teachers as a means of professional development (Wolfenden and Buckler 2012). There are similar projects underway in India, Malaysia and South America. Although there is some overlap with the open textbook projects, the focus here is more on localization and addressing the needs of a growing population seeking further education.

These brief examples illustrate that the OER field has begun to diverge from the initial OER implementation projects. Each of these distinct sub-groups has its own areas of concern, research questions, funding priorities, and key projects. Having established itself over nearly fifteen years of development, it is now timely then to consider the different cultures that are emerging within the broader field of OER, and to consider what are the key issues for each of these.

## Method

The OER Knowledge Cloud (<https://oerknowledgecloud.org/>) is an open access repository of research articles relating to OER. It is an initiative of the UNESCO and Commonwealth of Learning Chairs in OER, led by Athabasca University. It is a curated database, including journal articles, reports, books and other media with curation performed by librarians, an editorial team, and automatic searching and suggestions. Inevitably there will be some items it misses, but it represents the most comprehensive collection of OER related research available, dating back to 2001. The OER Knowledge Cloud then formed the basis for analysis of work in the OER field.

A suitable methodology for the categorization of text sources such as Abstracts is content analysis, which is defined as a ‘research technique for making replicable and valid inferences from data to their context’ (Krippendorff 1989 p. 21). Initial applications of content analysis were objective and quantitative in nature, to give an ‘objective, systematic and quantitative description’ of content (Berelson 1952 p.18) relying largely on word frequencies and text analysis to reveal patterns. The approach has been used on academic papers, for example to reveal the changing focus of interest in an academic discipline over time (Griggs & Collisson 2013). Later applications of content analysis have adopted qualitative approaches, for example in analyzing interviews (eg. Graneheim, B. Lundman 2004). Krippendorff (2004) argues that this distinction between quantitative and qualitative is a ‘mistaken dichotomy’, because any content analysis requires elements of quantitative (for example producing number counts) and qualitative (for example, when determining categories).

When conducting content analysis there are several key decisions to be made, which Berg (2007) defines as:

- Qualitative vs quantitative –there exists a continuum of quantitative – qualitative aspects, depending on the precise approach taken. Berg argues that content analysis ‘can be effective in qualitative analysis – counts of textual elements merely provide a means for identifying, organizing, indexing and retrieving data’.
- Latent vs manifest content – should analysis be confined to content that is manifest, ie actually present, or should latent content, that is, the overall impression be included? Berg differentiates this as surface versus deep content. Latent content is more

problematic as it relies on a further level of interpretation by the researcher and is thus more difficult to replicate.

- Units of analysis – this covers the granularity of each unit of analysis, for example the paragraphs in an article within a newspaper, or the whole articles themselves. It also determines what types of units are included and what is excluded; for example, the analysis might include newspaper articles written by journalists but exclude published letters.
- Category development – categories can be inductive, in that they emerge from the data, or deductive, where the researcher applies an existing theoretical framework. These can also be termed implicit and explicit. Categories should be mutually exclusive and exhaustive.

Using Berg's framework a mixed approach combining qualitative interpretation of data to produce a quantitative measure was adopted. The analysis would focus on manifest items only and not latent elements. The unit of analysis was the article abstract as listed in OER Knowledge Cloud. An inductive approach was used to determine the categories that arose from the data.

Using this approach the author performed a content analysis of the Abstracts of all 2015 publications in the Knowledge Cloud. This amounted to 119 publications (a breakdown by publications per year is shown in Table 1). Each abstract was classified according to two or three terms, based on key words and intended outcomes of the paper. A second round analysis was performed to abstract these to higher level categories.

The same analysis was conducted for an earlier period, that of 2007, to investigate any shifts in the type of topics the OER field is concerned with. 2007 was chosen because as Table 1 indicates it was the first year that might be seen to represent an emerging OER discipline, with 24 publications, compared to single digit totals for previous years.

## The emerging body of research

A simple analysis of the quantity of publications reveals how the OER field began to emerge, and research articles started to be published, shown in Table 1.

Year	No publications	Year	No Publications
2001	3	2008	58
2002	1	2009	67
2003	0	2010	153
2004	3	2011	121
2005	7	2012	167
2006	9	2013	205
2007	26	2014	183

Table 1 – Number of OER publications per year, as represented in the OER Knowledge Cloud.

The data in Table 1 demonstrate a considerable increase in publications in 2007, as the initial OER projects became established and started to publish work, and further projects were implemented. This can be seen as the first expansion of the OER movement from a few central projects. In 2010 there is another increase in the number of publications, which can be seen as a further expansion and acceptance of the OER approach, as it moves into the mainstream. The establishment of regular, well attended conferences such as OpenEd, the UK OER conference and OEGlobal (formerly Open CourseWare Consortium conference) can also be seen as indicative of this.

Analysis of the 2007 publications reveals relatively few key categories, unsurprisingly since there were only 26 entries, as shown in Table 2. The emphasis was largely on establishing OER projects and developing content.

Category	No Publications
Project case study	6
Technical	6
OER as subject	11
Research with impact data	3

Table 2: Types of OER publications in 2007



This demonstrates that as the field began to grow, resources were focused on developing the projects and infrastructure required, along with theorising about the application of OERs. By contrast, the categories for 2015 entries are shown in Table 3.

Category	No Publications
Project case study	8
Technical	7
OER as subject	18
Research with impact data	7
Policy	15
Practitioner	11
OER in Developing Nations	2
MOOCs	36
Pedagogy	9
Open data/practice/access	6

Table 3: Types of OER publications in 2015

These categories will now be described in more detail.

*Project case study* – this either reports on the findings of a particular case study, or announces the implementation of a project. It is differentiated from research with impact data, as it usually lacks the research rigour in assessing impact of OER implementation, focusing on the project details, such as number of resources created, downloads, etc. This type of publication was more predominant in the early OER period, as it was the main focus for activity. It still represents an important part of the overall literature, but often the case studies may be focused on particular aspects, blending with the other categories. An example from the 2015 entries is Mackintosh's (2015) update on the progress of the OERu.

*Technical* – these papers focus on the technical specification of a particular project such as an OER repository, or the required technical specification for an ecosystem or framework project. There is some overlap with case studies, but when the emphasis is on the technical components, the article has been included in this category. An example is Heinen *et al* (2015 p.1), who describe ‘a federated open ecosystem for OER using the German educational system as a use case’. While this could be categorized as OER as subject, or case study, the emphasis is on technical details of the ecosystem infrastructure and description of resources.

*OER as subject* – this category is focused on the OER field itself, the nature of openness, the direction for OER, suggestions for adoption, the role of OER in distance education. Unsurprisingly for a new discipline this has remained a constant theme, as the practitioners in the field reflect on its direction. This paper would fall into this category, and another example is Annand (2015 p.1), who explores the ‘financial issues regarding the sustainable production, dissemination, and use of Open Educational Resources (OER) in higher education’.

*Research with impact data* – this type of paper undertakes evaluation of the impact of OER implementation, using educational research methodology that would be recognized from more mainstream studies, such as control groups, pre and post test, etc. It is the type of research that is often difficult to perform in education where sample sizes are small, and often at the case study level. A good example in this sample is Fischer *et al* (2015 p. 159) with a study that ‘utilized a quantitative quasi-experimental design with propensity-score matched groups to examine differences in outcomes between students that used OER and those who did not’.

*Policy* – these articles report on existing OER policies, the need for policy or standardized approaches, national frameworks and comparison of policies. For instance Gondol and Allen (2015 p. 273) examine the Open Government Partnership ‘a strategy for securing national-level commitments to open education in participating countries’, making reference to specific policies. By contrast, the Contact North (2015) report on The Higher Education for the Sustainable Future We Want, looks at broad educational challenges, and how OER can play a role at national levels in addressing these.

*Practitioner* – the focus of these articles is the use of OER by practitioners in a particular context, for example teachers or librarians. OER is often a secondary consideration as to what it allows the practitioner to achieve; for example, Hills (2015 p.47) describes a model for content creation ‘with the student as producer model, whereby students’ interests are used to drive the identification and creation of educational content’. This utilizes OER to facilitate content adaptation and creation, but the student as creator model is the main focus.

*OER in developing nations* – the use of OER in the context of developing nations has received some attention with projects such as TESSA. These have been separated out as a category because the issues and community involved in such projects is often distinct from the North American or European emphasis of OER. An example is Nti (2015 p.156) who ‘examines how access to, and use of, open educational resources (OER) content may be enhanced for nonnative learners in developing countries from a learner perspective’.

*MOOCs* – massive open online courses have been an area of considerable growth since 2009. This group could be categorized as an emerging field of its own, or MOOCs could be interpreted as OER and reclassified under the other categories. However, there is a particular focus on MOOCs currently, and it was considered useful to differentiate this work from the main body of OER. Examples include Ho *et al* (2015), who investigate the Harvard and MIT MOOC data, Soffer and Cohen (2015), who detail the MOOC experience at Tel Aviv university, and Malin (2015), who uses autoethnography to investigate the MOOC learner experience.

*Pedagogy* – several articles focus specifically on the possible impact of OER on pedagogy, or as a vehicle for change in teaching practice. Although there is intersection with other categories, the highlighting of pedagogy in these papers has suggested a specific category of research. An example is Bossu, Smyth and Stagg (2015), who explore the impact of OER to develop a pedagogic model, called Open Empowered Learning Model.

*Open data/practice/access* – OER is related to other areas of openness, and while the coverage is not exhaustive, such articles are sometimes included in the OER Knowledge Cloud. This category then represents an intersection with other aspects of open practice that have varying degrees of relevance to the OER community.

## Discussion

This analysis has suggested ten areas which arise from the 2015 publications. Before considering these, whether they constitute different communities and their implications for the OER field, some caveats regarding the methodology will be addressed.

Firstly, although the OER Knowledge Cloud represents a good sample of OER articles, including not just journal articles but reports and presentations also, it is not exhaustive. It can be swayed by the inclusion of the outputs from a particular conference, for example, while another one may be absent. It should not be seen as the definitive record of OER related outputs. However, it probably represents a reasonable sample of the broad categories of interest. The proportions of these is questionable though, and different sampling methods would favour some categories more than others.

The content analysis method requires each unit to be placed in an exclusive category, but inevitably some will be related to two or three categories. The decision to place them in one group will therefore undervalue contributions to others, and the final decision as to which is the primary category is largely a subjective one. This method does allow for the creation of clearer categories, however.

Labeling the categories was largely a subjective process. Different categories could have emerged from the same sample set; for example, quality is a recurring theme, and open textbooks are an instantiation of OER that could be given a separate grouping. The determining factor for the construction of categories was whether they represented a particular interest or community within the overall OER field.

With these caveats in mind, the ten categories can now be considered. What these indicate is that the OER field has grown from a narrow discipline based around several key projects, to a broad field with several overlapping, and complementary themes. The boundaries of the OER field is blurred, intersecting with other areas that have themselves seen similar growth, including open access publishing, open data and open citizenship. Within the OER community we can see the growth of potentially a new area, which might branch off, namely that of MOOCs. Whether this continues to expand, or has peaked and becomes part of the general OER field will be seen over the next five years or so.

The categories themselves tell a story of how the OER field is developing. It is interesting that the four categories from 2007 are still relevant in 2015. The dominance of specific project case studies and announcements in the literature has subsided. While the number of papers detailing impact research has increased, it still represents a relatively small amount overall. Emergence of robust research from the many implementation projects can be seen as one of the key elements in facilitating the movement of OER into the mainstream. This analysis suggests that while it is occurring, empirical research is still an area of the OER field that needs encouragement. OER as subject has remained a prominent category. This could be interpreted as the field being inward looking, but it highlights the early phases of a discipline that is establishing its approaches, boundaries, and potential. Constant reflection and analysis can be seen as the method through which the field differentiates and establishes itself.

In contrast, policy related publications have grown substantially over the past few years. This indicates the maturation of OER as a practical solution, and the success of policy advocates such as Creative Commons and SPARC. Policy is regarded in these articles as a productive means of gaining uptake for OER, and thus an area worthy of resource allocation.

The use of OER by practitioners is also a reasonably large category. If this is combined with other practical focused categories such as technical and case studies then this accounts for around a quarter of the publications. The concerns of these OER practitioners might be very different from more theoretically oriented papers which can be found in the OER as subject category, or the more politically motivated policy type papers. After the OpenEd 2015 conference, Farrow (2015) highlighted the possible emergence of different cultures within the OER field, which he termed colonisers and edupunks. The former was more practically focused, using OER to replace existing practices, for example open textbooks, whereas the latter are interested in critiques of education and openness itself. This highlights an issue for conference organisers, which is: to what extent do they attempt to address all of the ten categories outlined above?

In a bibliometric analysis of OER publications from 2002 to 2013 Zancanaro, Todesco & Ramos (2015) found eleven macro-themes: Theoretical discussions;

Quality; Barriers to use; Open education; Incentive policies; Survey; Technology; Type; Sustainability; Production; Open licenses. Using a different methodology there is a good deal of similarity between the categories derived independently in this article. This suggests that an amalgamation of these themes would provide a good representation of the existing OER field.

The questions for the field then are to what extent these communities can be considered distinct, or different priorities of interest for one or two larger communities? These communities have different interests, and engage with OER for different reasons. As openness becomes increasingly part of mainstream practice, as evidenced by open access publishing and the popularity of MOOCs, then it may be that OER moves beyond being considered one movement, and elements become more integrated with other education areas. For example, communities around pedagogy, assessment, quality and educational technology can all be seen as distinct but areas where OER can provide useful solutions.

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